

**Remarks/Arguments:**

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 1-8, 10, 11, and 16-19 are pending; Claims 17-19 are withdrawn from consideration; Claims 10 and 16 are amended to address cosmetic matters of form; and Claims 9 and 12-15 are cancelled. No new matter is added by this amendment.

By way of summary, Claims 1-3, 5-8, and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Chen et al. (U.S. Pat. No. 6,016, 290, hereafter Chen), in view of Kobayashi et al. (U.S. Pat. No. 4,840,922, hereafter Kobayashi), and further in view of Peale et al. (U.S. Pat. No. 6,314,122, hereafter Peale), Majors, Jr. et al. (U.S. Pat. No. 5,850,411, hereafter Majors), and further in view of Ueyanagi (U.S. Pat. No. 6,396,776); Claim 4 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chen, Kobayashi, Peale, Majors, and Ueyanagi, and further in view of the Examiner's Official Notice; Claim 11 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chen, Kobyashi, Peale, Majors, and Ueyanagi, further in view of the Examiner's Official Notice; Claims 12, 13, 15, and 16 were rejected under 35 U.S.C. § 102(e) as anticipated by Stovall et al. (U.S. Pat. No. 6,404,706, hereafter Stovall); and Claim 14 was rejected under 35 U.S.C. § 103(a) as unpatentable over Stovall in view of Peale.

Magnetic recording devices that magnetically record and reproduce information have been developed as large-capacity, high-speed, and inexpensive information storing means. Especially, recent advancements in hard disk drives (HDD) have been remarkable to such a extent that recording density of finished commercial products reaches 10 Gb/in<sup>2</sup> (giga bytes per square inch) or greater, while an internal data transfer speed is 100 Mbps (mega bytes per second) or greater. Such advanced high-density HDDs have resulted from advancements of a variety of technical factors, including signal processing, servo mechanisms, heads, mediums,

HDI, and the like. However, thermal disturbances in mediums have been regarded as an impediment to further HDD density enhancement.<sup>1</sup>

Generally, enhancement of the magnetic recording density is implemented by miniaturization of recording cells (recording bits). However, since the signal magnetic field derived from the medium is diminished due to the miniaturization of the recording cells, medium noise must be reduced to achieve a specified signal to noise ratio (S/N). The medium noise results from disturbances in magnetization transit section, and a degree of the disturbance is proportional to a unit magnetic reversal. Although the magnetic medium made of thin film of poly-particles is used, the unit magnetic reversal in the poly-particle thin film consists of a numerous quantity of magnetized particles coupled to one another, thereby causing exchange bonding when magnetic exchange interactions mutually effect those particles. Thus, in order to further reduce the unit magnet reversal to ensure a specified S/N, a size of the magnetized particle itself must be reduced. In light of the above-described difficulties, the Applicants developed the present invention.

One of the features of the present invention is that the aperture is adapted so that a polarizing direction of the light emitted from the laser device is approximately perpendicular to a direction along a longitudinal extension of recording tracks formed on the recording medium, and a width W1 of the aperture taken along the polarizing direction is smaller than a width W2 of the aperture taken approximately perpendicular to the polarizing direction. According to the present invention, the polarizing direction coincides with a track width direction. In other words, the width W1 with the aperture taken along the track width direction is smaller than the width W2 of the aperture taken along the track direction perpendicular to the track width direction.

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<sup>1</sup> Specification, pages 1-3.

With regard to the rejection of Claims 1-3, 5-8, and 10 under 35 U.S.C. § 103(a) as unpatentable over Chen, Kobayashi, Peale, Majors, and further in view of Ueyanagi, that rejection is respectfully traversed.

Independent Claim 1, from which Claims 2, 3 and 5-8 depend, and independent Claim 10 both recite that a width of the aperture taken along the polarizing direction is smaller than a width of the aperture taken approximately perpendicular to the polarizing direction.

With these features, deficiencies of other systems may be effectively addressed. For example, as recognized by the Applicants, "the loss [of laser light] is increased as an aperture width is reduced in a direction perpendicular to the polarizing direction of the laser light while the loss is not increased as the aperture width is reduced in the same direction as the polarizing direction."<sup>2</sup> Based on this concept, a width along the polarizing direction of laser light (e.g., width W1) may be reduced to a dimension small enough to allow for light direction to a minute recording unit of a recording medium without significant loss of light. Thus, using the thermally-assisted magnetic recording head of Claim 1 and apparatus of Claim 10, a low noise poly-particle medium of which particles have a considerably minute diameter required for high density recording/reproducing may be sufficiently durable to thermal disturbance.<sup>3</sup>

Chen relates to a read/write head that includes an optical waveguide core 88 for guiding light into a medium 14. However, as admitted in the Office Action of October 9, 2002, Chen does not disclose or suggest any "specifics with respect to the size of any aperture and light-absorbing layer."<sup>4</sup>

Because Chen fails to disclose or suggest the inclusion of a masking layer having a light-emitting hole, it would not be obvious to one of ordinary skill in the art to combine the

<sup>2</sup> Specification, page 11, lines 22-25.

<sup>3</sup> Specification, page 12, lines 10-18.

<sup>4</sup> Office Action dated October 2, 2002, page 3, paragraph 7.

teachings of Kobayashi with Chen. Kobayashi relates to a masked semiconductor laser 10 that includes a masking layer 4 with a light-emitting hole K.<sup>5</sup> Additionally, Kobayashi does not provide any suggestion to incorporate its masking layer and light-emitting hole into a recording head system, such as the system set forth in Chen.

Peale relates to an optical detection apparatus including a laser that is able to operate in one of two states.<sup>6</sup> Majors relates to a laser diode arranged such that the laser operates in a TE polarization mode.<sup>7</sup> Applicants respectfully submit that it is not clear how any possible combination of Peale and Majors would remedy the deficiencies of Chen and Kobayashi, as related to the features recited in Claims 1 and 10, especially as the Office Action failed to set forth any specific explanation of which features of Peale and Major were being used to remedy the deficiencies of Chen and Kobayashi.

Simply because Peale or Major may describe lasers that operate in different modes of polarization, there is no indication that either Peale or Major discloses or suggests the aperture recited in Claims 1 and 10. As such, any combination of Peale and Major necessarily fails to remedy the deficiencies above-identified with regard to Chen and Kobayashi.

The Office Action then attempts to remedy the defects of the combination of Chen, Kobayashi, Peale, and Majors by relying upon Ueyanagi.

In Ueyanagi, a laser beam is condensed by an optical system such that a beam spot 9a on a condensed surface 6c is desirably small. Ueyanagi describes the width W of the aperture taken along the track direction X is smaller than the width L of the aperture taken along the track width direction Y, which is wholly different from the aperture widths recited in Claims 1 and 10.

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<sup>5</sup> Kobayashi, Figure 1.

<sup>6</sup> Peale, col. 5, lines 9-20.

<sup>7</sup> Major, col. 6, lines 50-52.

Accordingly, as Ueyanagi fails to disclose or suggest a width of the aperture taken along the polarizing direction being smaller than a width of the aperture taken approximately perpendicular to the polarizing direction, as recited in Claims 1 and 10, it is respectfully submitted that Claims 1 and 10 patentably distinguish over the applied combination of Chen, Kobayashi, Peale, Majors, and Ueyanagi. Likewise, dependent Claims 2, 3, and 5-8 are believed to patentably distinguish over Chen, Kobayashi, Peale, Majors, and Ueyanagi, either alone or in combination be withdrawn.

Moreover, it is respectfully submitted that there is no basis in the teachings of any of Chen, Kobayashi, Peale, Majors, or Ueyanagi to support the applied combination. Certainly, the Office Action fails to cite to any specific teachings within any of these references to support this combination. It is therefore respectfully submitted that the combination of Chen, Kobayashi, Peale, Majors and Ueyanagi is based upon hindsight reconstruction, and is impermissible. ✓

Regarding the rejection of Claim 4 under 35 U.S.C. § 103(a) as unpatentable over Chen, Kobayashi, Peale, Majors, and Ueyanagi, and further in view of the Examiner's Official Notice, that rejection is respectfully traversed.

Claim 4 depends from Claim 1. As noted above, none of Chen, Kobayashi, Peale, Majors, or Ueyanagi, either alone or in combination discloses or suggests the features of Claim 1. It is respectfully submitted that the Examiner's Official Notice cannot and does not remedy the deficiencies of Chen, Kobayashi, Peale, Majors, and Ueyanagi.

As set forth in MPEP § 2144.03, "It is never appropriate to rely solely on 'common knowledge' in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based." Zurko, 258 F.3d at 1385, 59 U.S.P.Q.2d at 1697. ✓

Accordingly, it is respectfully requested that documentary evidence be supplied by the Examiner to support this assertion or that the rejection be withdrawn.

Even if the Official Notice were assumed true, the Official Notice does not address the above-explained deficiencies of the cited references. Accordingly, it is respectfully submitted that the Office Action has failed to provide a *prima facie* case of obviousness, and withdrawal of the rejection of Claim 4 is respectfully requested.

With regard to the rejection of Claim 11 under 35 U.S.C. § 103(a) as unpatentable for the reasons set forth with regard to Claim 10 and further in view of the Examiner's Official Notice, that rejection is also traversed.

As noted above, none of Chen, Kobayashi, Peale, Majors, and Ueyanagi discloses or suggests the features recited in Claim 10. It is respectfully submitted that the Examiner's Official Notice does not remedy the above-identified deficiencies of the applied combination.

As noted above, it is respectfully requested that a reference be supplied in support of the Examiner's assertion, or that the rejection be withdrawn. As it stands, there is no support in the record for the Examiner's Official Notice.

Assuming that the Official Notice were correct, the Official Notice does not remedy the above-identified deficiencies of the applied combination. Therefore, Applicants respectfully submit that the Office Action has failed to provide a *prima facie* case of obviousness, and it is respectfully requested that this rejection be withdrawn.

With regard to the rejection of Claims 12, 13, 15, and 16 under 35 U.S.C. § 102(e) as anticipated by Stovall, that rejection is also traversed. Claims 12, 13, and 15 depend from Claim 10.

Stovall relates to laser mounting for a thermally assisted GMR head. As earlier noted, however, the Office Action dated October 9, 2002 admits that Stovall does not disclose or suggest any specifics with respect to the size of any aperture and light-absorbing layer. Accordingly, in the absence of such disclosure, it is respectfully submitted that it is not possible for Stovall to anticipate Claims 12, 13, 15, and 16 under 35 U.S.C. § 102(e) (since

the Office Action admits that Stovall does not disclose or suggest any aperture sizing). It is therefore respectfully requested that this rejection be withdrawn.

Regarding the rejection of Claim 14 under 35 U.S.C. § 103(a) as unpatentable over Stovall in view of Peale, that rejection is also traversed.

Claim 14 depends from Claim 10. As earlier explained, neither Stovall nor Peale, either alone or in combination, discloses or suggests the features recited in Claim 10. It is therefore respectfully submitted that Claim 14 patentably distinguishes over the applied combination of Stovall and Peale, and it is respectfully requested that this rejection be withdrawn.

Moreover, it is respectfully submitted that there is no basis in the teachings of either Stovall or Peale to support the applied combination. Certainly, the Office Action fails to cite to any specific teachings within either Stovall or Peale to support this combination. It is therefore respectfully submitted that the applied combination of Stovall and Peale is the result of hindsight reconstruction, and is impermissible.

As the only amendment to the claims is directed to minor cosmetic matters of form, and no amendments are submitted in response to any rejection on the merits, a further rejection of these claims based upon newly cited prior art in the next communication **cannot properly be considered a Final Office Action.**

Consequently, in view of the foregoing discussion and present amendments, it is respectfully submitted this application is in condition for allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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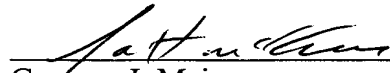
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